OPTICAL FIBER RING COMMUNICATION SYSTEM

ABSTRACT OF THE DISCLOSURE

An optical fiber ring network includes a plurality of interconnected nodes, each pair of neighboring nodes being interconnected by a pair of optical links. Using coarse wavelength division multiplexing, data is transmitted in both directions over each link, using a first wavelength λ1 to transmit data in a first direction over the link and a second wavelength λ2 to transmit data in a second, opposite direction over the link. The two wavelengths λ1 and λ2 differ by at least 10 nm. Each of the data streams transmitted over the optical link has a bandwidth of at least 2.5 Gbps. Further, each data stream has at least two logical streams embedded therein. A link multiplexer at each node of the network includes one or more link cards for coupling the link multiplexer to client devices, and one or more multiplexer units for coupling the link multiplexer to the optical links. Each link card includes frame buffers capable of storing numerous Fibre Channel frames that are being transmitted to and from the client device(s) coupled to that link card. The link card also includes flow control logic for pre-filling the frame buffers with frames of data before the receiving client devices send flow control messages to request their transmission. The combined effect of the frame buffers and flow control logic is that the full bandwidth of the links can be utilized even when the network nodes are very far apart and the client devices have small input data buffers.